USAF Declass/Release Instructions On File

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31 December 1958

MEMORANDUM FOR: Acting Chairman, Agency Planning Group for Mechanically Integrated Reporting and Communication System

SUBJECT : AFCIN Automatic Disseminator and Minicard Projects

I. Introduction:

a. OCR has provided the Committee with a separate briefing and written summary of the Air Force/General Electric recommendations for introduction of electrical/mechanical equipment to expedite the processing, evaluation and control of air targeting intelligence data.

b. While the AF Minicard and Automatic Disseminator projects were inaugurated some 3 or 4 years in advance of the GE contract (effective 1 February 1958), the latter specifies that a total system shall be designed capable among other things of performing all of the activities for which Minicard and the Disseminator were also designed. The implications of this requirement apparently were not threshed out initially. GE was instructed to take all related Air development projects, e.g., Minicard, Reconnaissance Data Processing Set, Electrophotoviewer, Elint-Photo Data Analyzer, Mechanical Language Translator, Magnacard, and Comac-Generalized Literature Searching Device, into account and to insure compatibility between these and its own equipment proposals, or offer overriding proof against their utilisation. Now (December 1958) AF has initial Minicard and Automatic Disseminator equipment installed and under test plus a G.E. proposal for a comprehensive system which so far as is known makes no provision for use of either of these. The situation is reported to have been complicated further by a recent new AF contract with Eastman Kodak for two additional sets of Minicard for use by ATIC and SAC.

The issue is clearly stated in a recent AF report on initial testing of Minicard in which one of the assumptions is given as follows:

> "c. That the G.E. study of AFCIN-1 will recommend continued use of Minicard in 1B. (It should be noted that in the event G.E. recommends equipment other than Minicard, such hardware is not procurable 'off-the-shelf' and will not be available until 1960)."

It seems certain that AF could not afford two totally different and expensive processings of the same document flow. Their decision on whether to proceed with G.E. proposals and, if so, how to employ Minicard and the Automatic Disseminator are still to be announced.

II. Automatic Disseminator

a. There is attached a one-page description of the principal mechanical and operating features of the disseminator.

b. The equipment was designed for operation with Minicard as an integrated element of the AFCIN central document processing system. Minicard, in turn, was closely patterned after the CIA Intellofax System which provides for subject coding of documents according to a heirarchical classification system, storage and manipulation of codes in IBM punched cards, and microfilming of documents to provide a variety of viewing and reproduction services to customers.

c. The AF automatic dissemination system operates as follows:

1. Customer offices submit reading requirements to the AFCIN Headquarters dissemination activity. The text of these subject requirements is converted into six-digit code according to the CIA Intelligence Subject Code (ISC). Customer identification code is combined with each subject/area requirement to constitute a machine word. All such requirement "words" are stored in binary code in the memory of the Automatic Disseminator.

2. All incoming Air information reports are subject coded while in master copy state by the AFCIN Minicoding staff according to the Intelligence Subject Code. The codes are recorded by Flexowriter on punched paper tape. The tape and the related information report are processed through the Minicard Camera. The tape alone is next introduced as input to the Automatic Disseminator. The Disseminator matches document codes with the requirement codes stored in its memory and produces a list of AF offices requiring copies of the document. The quantity of copies indicated is forwarded as an instruction along with the master copy document to reproduction for printing and distribution.

d. Air Force test experience with the Automatic Disseminator

In a September 1958 test of machine and manual dissemination of a collection of 300 documents, the following conclusions were reached:

1. The machine specified dissemination of an average of 31 copies of each document compared with an average of 21 copies in manual dissemination.

2. Manual dissemination was judged to have 75% accuracy with over and under-dissemination cancelling each other out.

3. The 50% increase in copies resulting from machine dissemination was attributed to the following factors:

   6% of the increase was due to errors in coding documents.
   75% of the increase resulted from the more detailed expression of requirements possible under the ISC as compared with the BAIR (Basic Air Intelligence Requirements).
   19% of the increase was attributed to the fact that document subject codes are in greater detail than the subject identification made by analysts in manual dissemination.

4. The machine cannot determine priority customers, allocate inclosures nor make release decisions. The requirements of 12 customers cannot be machine coded and manual dissemination will be necessary indefinitely in these cases.

5. Average output per Minicoder including manual dissemination is 25 documents per day. The rate expected for Minicoding and machine dissemination is 35 documents per coder per day.

6. AF reproduction facilities cannot accommodate a 50% increasing in printing load. The machine coded reading requirements are being rigorously pruned with the hope that automatic dissemination can be started early in 1959 with copy requirements cut back to about the present average of 21 per document.

III. Minicard

1. Description:

Only those features of Minicard of immediate interest to this Committee are discussed below. Development of the system has proved extremely difficult and complex. CIA/OCR has also acquired a set of the equipment and is now in process of working out detailed plans for its test. The OCR tests are being planned on the basis of some ten years of experience with Intellofax. For the Air Force, on the other hand, Minicard represents a

first approach to a central indexing, storage and retrieval system. For this reason, some of the AF conclusions set forth below are viewed with considerable scepticism in OCR at the present time.

The basic unit in Minicard is a piece of high resolution film 1¼" x 5/8" in dimension. Up to 12 page-images may be stored on each Minicard at a reduction ratio of 60-1. Alphabetic or numeric characters may be stored in the Minicard code field. The code is recorded in binary representation. Each column of code is made up of 43 binary digits - six binary digits per character, or seven characters per column with an additional binary digit for checking purposes. Any number of codes per document and any length of document may be stored in Minicard by use of trailer cards.

As is the practice in the Intellofax punched card system, a copy of the Minicard is produced and filed under each subject and area code assigned the given document. Multiple files are envisioned, one with Minicards arranged by subject, a second by area and others by source or control number as desired. For a document assigned five subject codes, the Minicard subject file therefore contains five duplicate Minicards with one copy filed at each of the five code locations specified.

Coding is performed according to the Intelligence Subject Code with the additional option of recording as desired clear text information such as names of persons, places or things.

2. AF Minicard test

The Air Force operated its Minicard installation continuously during September 1958 and processed 6,072 documents into the system. Its representatives have stated the following conclusions from the test:

a. The equipment performed reliably. (Note: development problems forced major reductions in equipment operating rates throughout the system.) 2/

b. "Minicards can perform any function that punched cards can". 2/

2/ Memo for Director, CIA, attn: Mr. Paul A. Borel, Subject: Minicard Utilization Report, dated 16 December 1958. CONFIDENTIAL.

c. "It has been estimated that many analysts spend more than half of their time in looking for information. The full utilization of Minicards will enable them to greatly reduce this personal search time, thus allowing analysts to devote more time to analyzing and preparing improved reports. Individual files of analysts can be dispensed with." 2/

d. Original plans for dissemination of Minicards in lieu of hard-copy documents will not be pursued for the present for the following reason:

> "...it appears pointless for IB to program delivery of duplicate Minicards to 'customers' at this time and until (1) customers are firmly committed to the use of Minicards, and (2) adequate Minicard components can be made available to such customers." 1/

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OCR Representative

1/ Memo thru Director, Collection & Dissemination for ACS, Intelligence Subject: Report on the Recent Tests of Minicard... dated 7 October 1958, CONFIDENTIAL.

2/ Memo for Director, CIA, attn: Mr. Paul A. Borel, Subject: Minicard Utilization Report, dated 16 December 1958. CONFIDENTIAL.

AUTOMATIC DISSEMINATION

Main features of the USAF Document Data Processing Set

physical units - 1) drum cabinet, 2) logic cabinet, 3) power cabinet

memory - magnetic drum, 16" diameter, 1800 rpm

220 channels, 100 words per channel, capacity 22,000 words

60 bits per word = 10 alphanumeric or 15 numberic characters per word

200 channels are allocated to the memory, 20 channels to programs

3 of the program channels are allocated to one-word re-circulating registers:

Accumulator register - in which results of arithmetic operations appear.

Command register - in which the command to be executed is stored and deciphered.

Input-Output register - means by which data enters or leaves system.

command structure -

arithmetic commands - (1) clear and add, (2) add, (3) subtract (4) send

logical commands - (1) logical or, (2) extract (equivalent to logical and command), (3) shift right or left, (4) extract numeric, (5) halt.

decision commands - (1) transfer control, (2) compare equality, (3) compare greater, (4) compare less, (5) test zero, (6) test switch, (7) stop.

input-output commands - (1) input alphanumeric, (2) input numeric, (3) output alphanumeric, (4) output numeric.

searching and handling commands - (1) search for equality (2) search for greater, (3) transfer to auxiliary channel, (4) transfer auxiliary channel to memory

operation - punched tape or electric typewriter input or output. 5 modes of operation for writing, erasing, shifting and verifying information introduced into the system.